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IS 12060 (1987): Code of practice for selection of rotary vane feeders [MED 6: Continuous Bulk Conveying, Elevating, Hoisting Aerial Ropeways and Related Equipment]

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UDC 621·86·067·2 : 006·76

IS : 12060 - 1987

(Reaffirmed 1998)

Indian Standard

CODE OF PRACTICE FOR SELECTION OF ROTARY VANE FEEDERS

1. Scope — Lays down the code of practice for the selection of rotary vane feeders commonly used for handling fine free flowing materials.

2. Application — Feeders covered by this standard are used where an air seal between the inlet of the feeder and the outlet of the feeder is required and where a close estimation of the material being discharged is important. By attaching a revolution counter to the feeder shaft and carefully calibrating the quantity delivered against revolutions per minute, a fairly accurate measurement of the discharge can be made.

3. Type of Feeders — Basing on the construction of the feeders, these can be divided into 3 types (*see* Fig. 1).

3.1 *Type* A — This is the most common type and used extensively for handling fine pulverized or granular material small enough in size and sufficiently friable so that lumps will not jam between the close fitting radial vanes and the housing. The material enters the housing from the top and as the rotor revolves each pocket discharges as it reaches the opening in the bottom. The small clearance between the vane and the housing prevents free passage of air between the inlet and outlet sides of the feeder. For dimensions of this type of feeder a reference may be made to IS : 12059-1987 'Dimensions for rotary vane feeder'.

3.2 *Type* B — This is a feeder with substantial clearance between the vanes and the housing on the feeding side which is used for lumpy or non-uniform material. This type provides adequate control of the flow of material with lumps of reasonable size and at the same time avoids chocking or jamming.

3.3 *Type* C — This feeder is frequently used for handling materials which are stringy or have a tendency to mat or cling together. A feature to this arrangement is the counterweighted hinged vertical bin section above the rotor which restricts the flow of material under normal working conditions, but provide automatic means of relief if an oversized piece becomes lodged against the rotor.

3.4 There are other types of rotor vane feeders which are used for special purposes:

a) If the material is abrasive then outrigger bearings are essential. These are also essential for high temperature, pressure, contamination and for material with very small particle size thus tending to create large amount of dust.

b) Very high temperature valves require special bearings and special materials of construction like stainless steel.

c) If material is likely to build up on rotor blades or casing or if very close sealing between the inlet and outlet sides of the value is required, then fitting of special tips on the rotor blades shall be necessary.

4. Dimensions — The dimensions for the standard rotary vane feeders are given in IS : 12059-1987.

5. Material — For all the above three types A, B and C, material of construction shall be as given below:

Component	*Material*
Body	FG 250 cast iron of IS : 210-1978 'Specification for grey iron castings (*third revision*)'.
Rotor	FG 250 cast iron of IS : 210-1978.
Shaft	*See* IS : 9550-1980 'Specification for bright bars'.
Bearing	Roller bearings of IS : 6453-1984 'Technicel supply conditions for rolling bearings (*first revision*)'.

5.1 Materials of construction of feeder and its components for hot, abrasive and corrosive applications shall be as agreed to between the purchaser and the manufacturer.

Adopted 1 April 1987

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Conveyors, Vertical Hoists and Bucket Elevators Sectional Committee, EDC 61; Feeders Subcommittee, EDC 61 :9 [Ref: Doc : EDC 61 (2985)]

6. Construction — Rotary vane feeders consist primarily of a number of vanes attached to central shaft which is supported on two bearings and which rotates inside a cast or fabricated housing. The drive to the shaft is usually by chain and sprockets from a geared motor.

7. Capacity — The volumetric capacity of the vane feeder depends on the size of the rotor, that is, diameter x length and on the revolution per minute of the rotor. For the same size of the rotor, the capacity can be varied by varying the speed of the rotor.

8. Speed of the Feeder — Usually the speed of the rotary vane feeder ranges from 5 to 40 rev/min. When selecting the speed of a feeder, it is important to bear in mind that a slow speed valve gives better sealing and that the volumetric efficiency decreases with an increase in speed. Table 1 gives the values showing the approximate efficiencies at different speeds.

TABLE 1 EFFICIENCY FACTORS

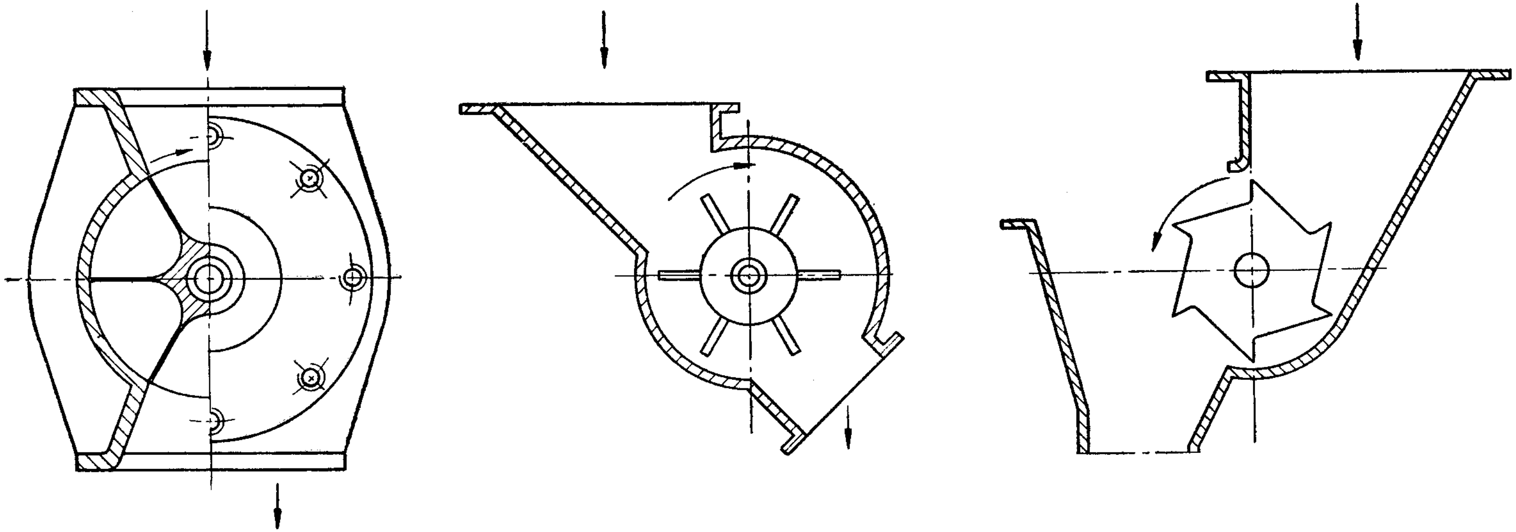
Vane Speed, rev/min	0 up to 10	Over 10 up to 20	Over 20 up to 30	Over 30 up to 50
	Efficiency Factor			
Full head of material	0·95	0·75	0·65	0·5
Manual tip in hopper	0·9	0·75	0·6	0·5
Feed from conveyer	0·9	0·75	0·5	0·4
Feed from cyclone collection	0·75	0·5	0·4	0· 33

9. Data to be Supplied by the Purchaser and the Manufacturer — For the guidance of the manufacturer, the purchaser shall furnish a list of relevant data of the feeder required by him. Similarly, to enable the purchaser to select a suitable feeder, the manufacturer shall furnish the relevant data-about the feeder manufactured by him.

10. Marking — A rotary vane feeder shall be marked with its type capacity and speed.

EXPLANATORY NOTE

This standard is based on the information from manufacturers and purchasers organizations.



TYPE A TYPE B TYPE C

FIG. 1 ROTARY VANE FEEDER

Printed at Printrade, New Delhi, India